UCCS Campus Sustainability and Energy Management

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The Business of Energy Management. September 20, 2006

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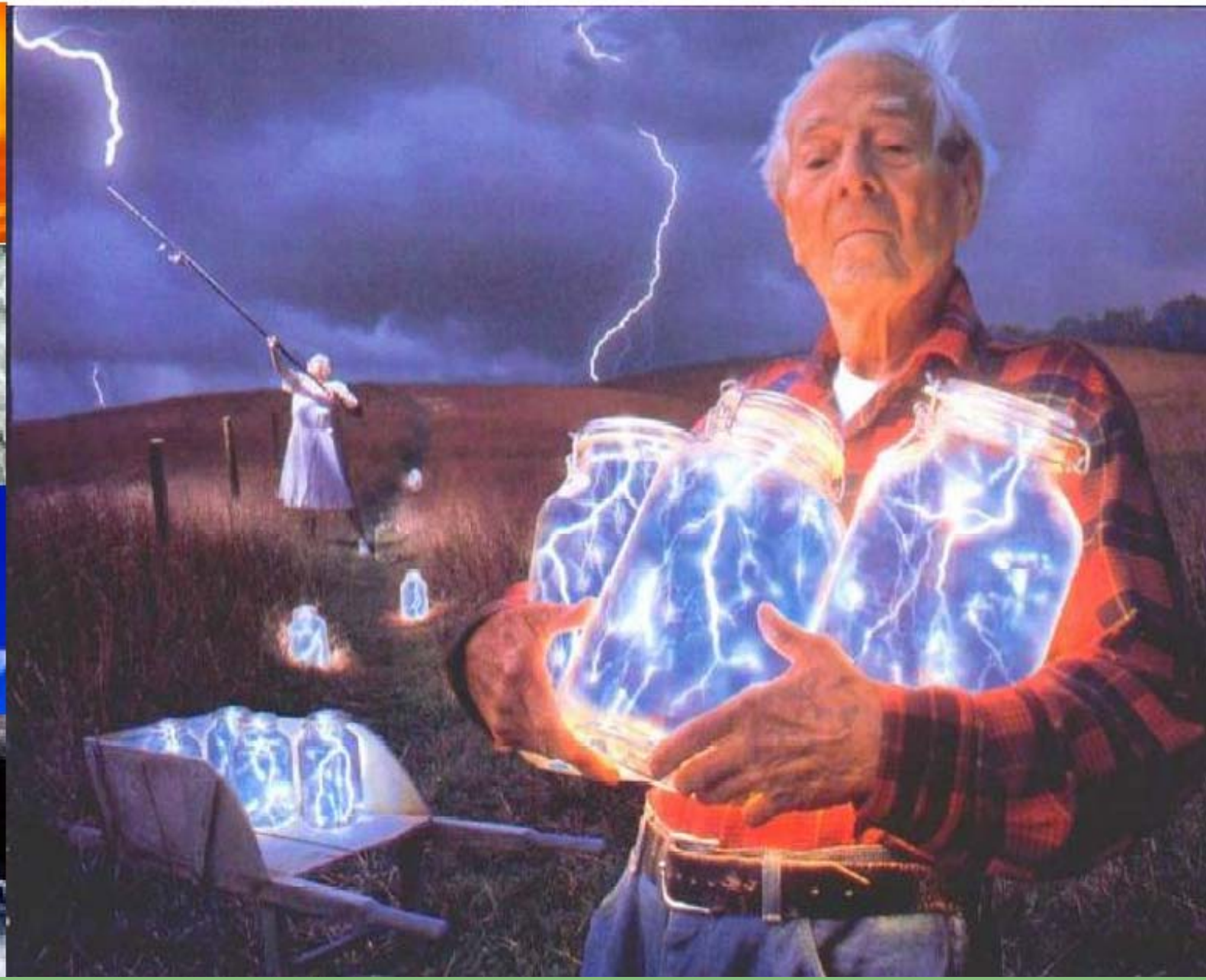
Today's Talk

- Introduction – Background
- UCCS –approach to energy management
- Obstacles/challenges/opportunities
- Resources

Where will our future energy sources come from?



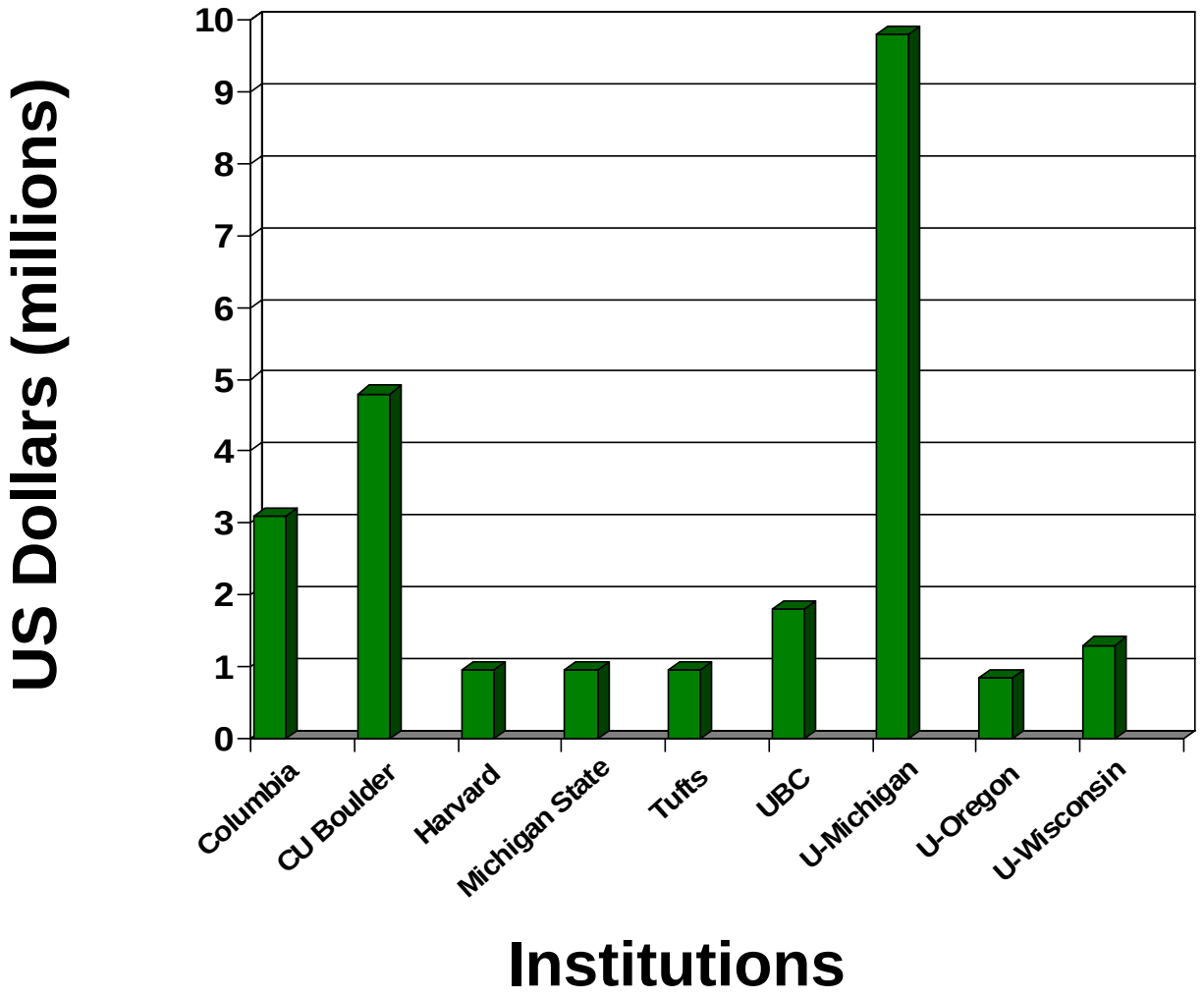
Higher Education Impact

The higher education population in the US is greater than the population of Australia.

Annual direct and indirect impacts of American higher education industry over $1.2 trillion.

M'Gonigle, Michael and Justine Starke.2006. Planet U: Sustaining the World, reinventing the University

Annual Savings by University Environmental Sustainability Programs



Rosemary Collard, “Annual Savings by University Environmental Sustainability Programs,” adapted from Garrett W. Meiggs, *Campus Sustainability in Higher Education*, Ithaca:Cornell University, 2005.

UNIVERSITY OF COLORADO AT COLORADO SPRINGS

- **7,854 students**
- **1.2 MSF of facilities**

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521 acres--
82 currently developed

Considered the growth campus of the CU system with planned expansion up to 25,000 students

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Ideal Process Energy Management…

Leadership Energy Goal

Example: Reduce energy consumption to 10% below 2000 levels by 2010

Reinvestment

Baseline → **Methods** → **Measurement & Verification**

Baseline	Methods	Measurement & Verification
Inventory of buildings	Capital investment	Utility Bill Analysis
Utility bill analysis	Operations and maintenance	Calculation of reduced loads
Building audits	Behavioral campaign	

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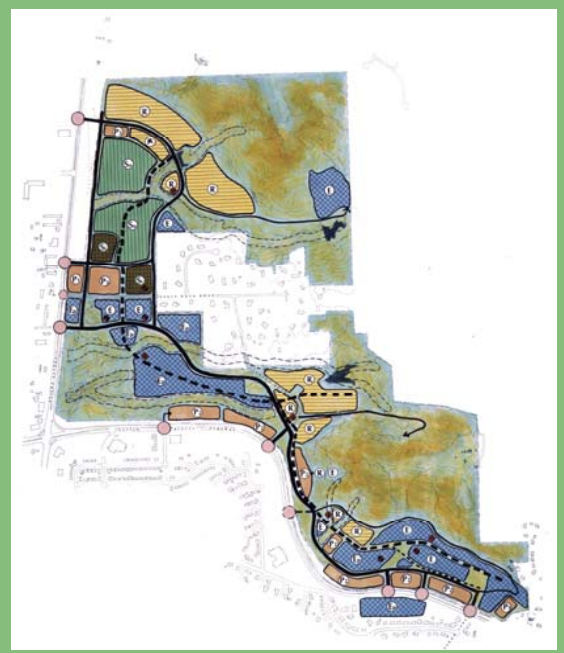
UCCS Approach to Energy Management

Resource Conservation

Green Buildings

Planning



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Resource Conservation

Capital Intensive

Energy Performance Contracting

Low cost/no cost

Operations and Maintenance

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2005 $1.3 million Energy Performance Bond

- Lighting retrofits (exit signs, occupant sensors, etc.)
- Energy Management System
- Water saving technologies
- Energy conservation education
- New Chiller with evaporative pre-cooling

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ECM #1 – Lighting retrofit

Total Project cost	$73,667
Simple Payback	2.56 years
Anticipated Savings per year	**$28,809**
Reduced CO2 (greenhouse gas)/yr	641,758 lbs.

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Operations and Maintenance

- Facilities Resource Conservation Group
- Utility Bill Analysis - $22,000 tax refund, $5-6K savings per year
- 2006 - Colorado Springs Utilities Audit - identify low cost/no cost efficiency measures

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Sample Spreadsheet for O&M and Capital Projects

#	Conserv. Categ.	Loc.	Project Description and Goal	Project Status	Cost	Source of Funding	Payback yrs. IRR % NPV $	Benefits
1	Energy	Parking Garage	AHU running 24/7. Plan – Readjust Setpoints	Complete	--	N/A	Need to calculate	Decreased energy use by XX
2	Energy	Science Eng. UHall, Eagle Rock	Lighting retrofit – T-12 to T-8's, Magnetic to Electronic ballasts	Complete	$73.6K	EPB	2.36 39 %	Decreased energy use, comfort

Source for spreadsheet format: Moe Tabrizi-Energy Conservation Officer, CU Boulder

New Buildings

- 2006 - LEED certification goal for Rec. Center and Science Engineering Building
- 2006 - Solar pre-heat for Rec. Center swimming pool, first renewable energy purchase
- Commission all new buildings

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Sustainability Planning

- 2006 - UCCS Master Plan
- Campus Design Guidelines
- Landscape Master Plan
- Building Specifications

Obstacles/Challenges

I don't have time to analyze the efficiencies of different boilers!

Paybacks?

It's broken now, I need to fix it yesterday!

Rebates?

I only have $20,000 to spend today!

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Challenges

- Time
- No mechanical specs.
- First cost accounting
- Knowledge
- Staff Shortages
- Inertia – "I've always done it this way"
- Savings for future conservation projects
- Selection of capital projects

Successes

- Chiller with Evaporative pre-cooling
- Facilities more aware and involved in energy conservation
- Sustainability Action Plan for Campus
- Solar pre-heat for Rec. Center

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Resources

- Local utility company – audits, rebates
- Energy Management Training *Energy Management Certification* – Northwest Energy Education Institute
- Energy Efficient Operation of Commercial Buildings: Redefining the Energy Manager's Job

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